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Distribution of Effective Teachers in Tennessee Schools

Research Brief: December 2009

Tennessee's 2006 Teacher Equity Plan's review of 2004-05 data revealed that high poverty and high minority schools had a larger percentage of beginning teachers, a smaller percentage of teachers with master's degrees, and a lower percentage of core academic courses taught by highly qualified teachers (HQTs) than low poverty and low minority schools. In 2007, through follow-up analyses using 2005-2006 teacher effect data, Tennessee found that students in high poverty/high minority schools had less access to the state's most effective teachers and more access to the state's least effective teachers. The state concluded that a clear equity problem existed.

This 2009 report seeks to update the 2007 teacher effectiveness study by analyzing teacher effectiveness in high priority schools. Using teacher effect data for 2007-08, the report concludes that an equity gap exists and varies by subject. Students in Tennessee's high priority schools have less access to the state's most effective teachers in reading/language arts, English II, and Algebra I and more access to the state's least effective teachers in reading/language arts and math than students in other schools across the state.

Teacher Effectiveness

This report use statewide teacher effect scores to examine teacher effectiveness in high priority and other Tennessee schools. The teacher effect score measures student progress on statewide achievement assessments for the school year 2007-2008. Teachers whose students' progress on achievement assessments exceeds the growth standard on average have positive teacher effect scores. Teachers whose students' achievement results fail to meet the state's growth standard on average have negative teacher effect scores. The teacher effect score is zero for teachers whose students' assessment results met the state's growth standard on average. For the purposes of this analysis, teachers are divided into one of three categories based on their teacher effect scores: "Least Effective", "Most Effective", or "Average Effectiveness". The "Least Effective" teachers have teacher effect scores that are strongly negative (at least one and a half standard errors below zero). The "Most Effective" teachers have teacher effect scores that were strongly positive (at least one and one half standard errors above zero). Teachers of "Average Effectiveness" have teacher effect scores that are close to zero (within one and a half standard errors from zero). The analysis that follows reports results for the most and least effective teachers by subject and grade span for high priority and all schools in Tennessee.

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High Priority Schools vs. All Schools

High priority schools in Tennessee are schools whose students did not meet performance benchmarks for two consecutive years and include both Title I and non-Title I schools. High priority schools are not all high poverty schools but are all schools in need of highly effective teachers to help their students meet performance benchmarks.

Figures 1 through 4 examine the distribution of the most and least effective teachers in high priority schools and all schools statewide by subject and grade span. **Figure 1** explores the distribution of most effective teachers in reading/language arts and math in grades 3-8. **Figure 2** examines the distribution of most effective teachers in English II and Algebra I in high school. **Figure 3** shows the percentage of least effective teachers in reading/language arts and math in grades 3-8, and **Figure 4** reveals the percentage of least effective teachers for English II and Algebra I in high school.

These figures indicate that students in high priority schools have less access than students in schools across the state to the most effective teachers in English II, Algebra I, and reading/language arts, and more access to the least effective teachers in reading/language arts and math. Only in math do students in high priority schools have more access than students in schools across the state to the most effective teachers, and only in Algebra I do students in high priority schools have less access to the least effective teachers.

The results also show that the inequitable distribution of least effective teachers was most significant for reading/language arts: 5.2 percentage points (7.4% for high priority schools compared to 2.2% for all schools). Similarly, the equity gap affecting most effective teachers was greatest for English II: 5.6 percentage points (10.2% in high priority school compared to 15.8% in all schools).

Equally troubling, the percentage of most effective teachers was much lower in reading/language arts (2.4% - 2.9%) than in math (14.2% - 16.4%), English II (10.2% - 15.8%). and Algebra 1 (25.6% – 28.5%), indicating the need to improve the quality of reading/language arts teachers across Tennessee schools.

These findings are important as Tennessee works towards an equitable distribution of highly effective teachers. Students in Tennessee's high priority schools need highly effective teachers to help them improve their rate of academic progress.

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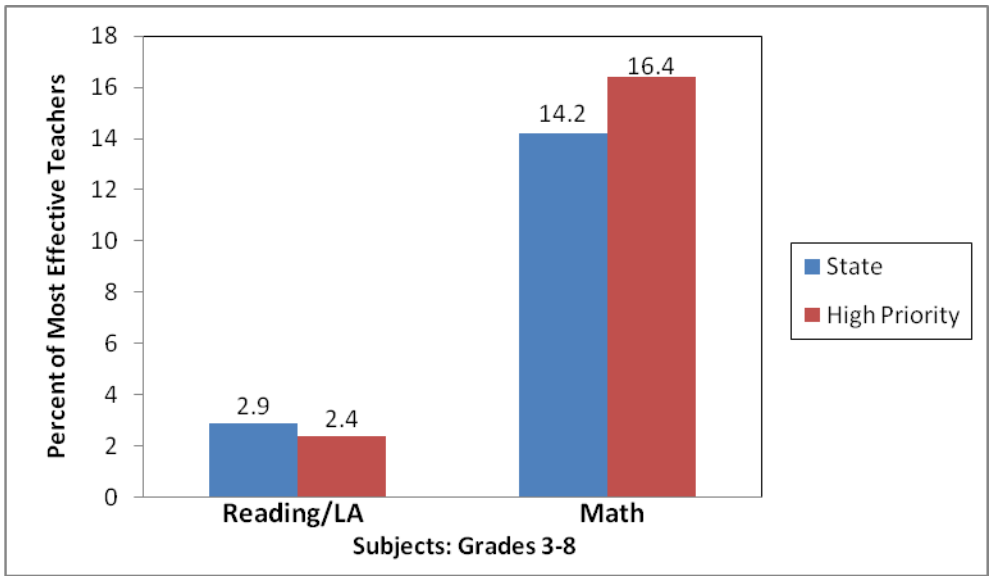
Figure 1: Distribution of the Most Effective Teachers: Grades 3-8



(SAS Institute Inc., 2009)

Figure 2: Distribution of the Most Effective Teachers: High School

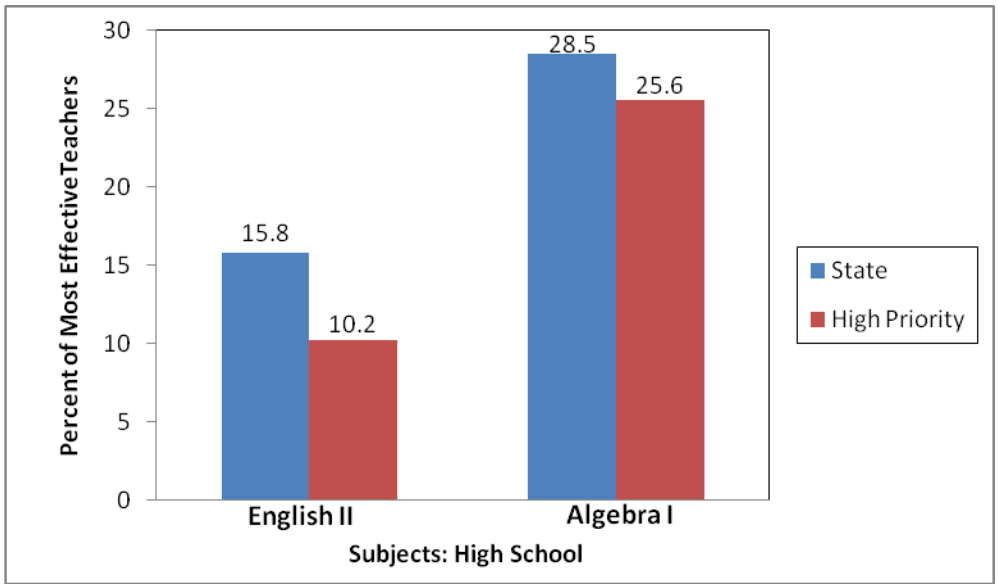


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Figure 3: Distribution of the Least Effective Teachers: Grades 3-8

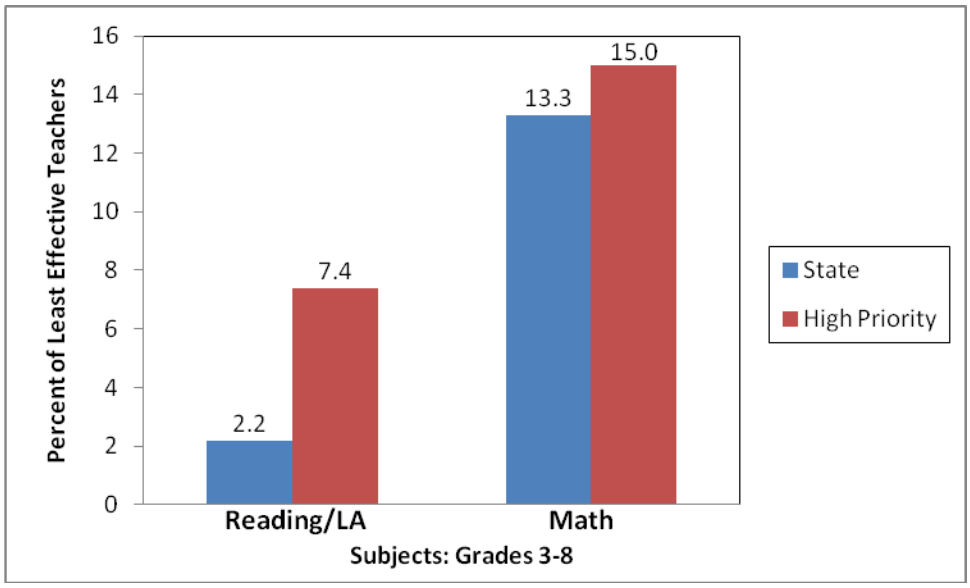

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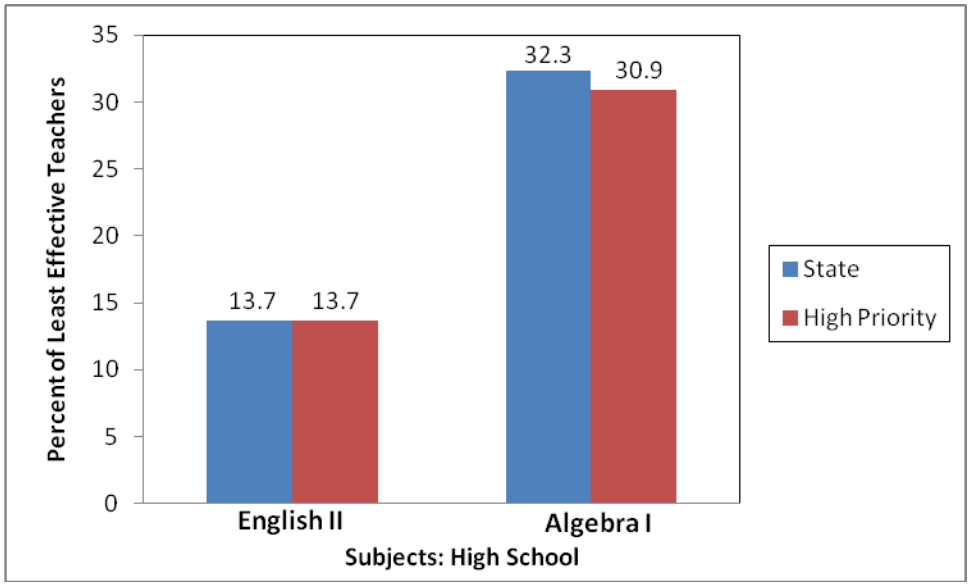
Figure 4: Distribution of the Least Effective Teachers: High School



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Conclusion

This study finds that students in Tennessee's high priority schools have less access to the state's most effective teachers and more access to the state's least effective teachers. The results indicate a disparity in teacher effectiveness across schools in Tennessee and point to the need for continued efforts to analyze and correct this disparity.[1] Through continuous evaluation at the state, district, school, and classroom levels, these data can guide policymakers and educators alike in improving instruction and matching teachers to the students who need them the most.

[1] These results support those from the 2007 study, which concluded that students in Tennessee's high poverty/high minority schools have less access to the state's most effective teachers and more access to the state's least effective teachers. (See the Appendix for a detailed discussion of teacher effectiveness in high poverty/ high minority schools and low poverty/low minority schools.).

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Appendix

Teacher Effectiveness Comparison for Math in Grades 3-8

by School Type and Experience Level

This section uses 2007-08 data to compare the distribution of teachers in the "least effective" and "most effective" categories. Using statewide teacher effect scores in math (elementary level), it first compares teacher effectiveness in schools that serve high proportions of students in poverty and high proportions of minority students (high poverty/high minority) versus teacher effectiveness in schools that serve low proportions of students in poverty and low proportions of minority students (low poverty/low minority).[1] The final sections examines variation in teacher experience levels across high poverty/high minority and low poverty/low minority schools.

High poverty/high minority schools have at least 75% students who qualify for free or reduced price lunch and at least 75% students who are African-American, American Indian/Alaska Native, Asian/Pacific Islander, or Hispanic/Latino. Low poverty/low minority schools have less than 25% students who qualify for free or reduced price lunch and less than 25% students who are African-American, American Indian/Alaska Native, Asian/Pacific Islander, or Hispanic/Latino.

Teacher Effectiveness Comparison by School Type

Tennessee's teacher effectiveness data indicate that students in high poverty/high minority schools have less access to the most effective teachers and more access to the least effective teachers than students in low poverty/low minority schools.

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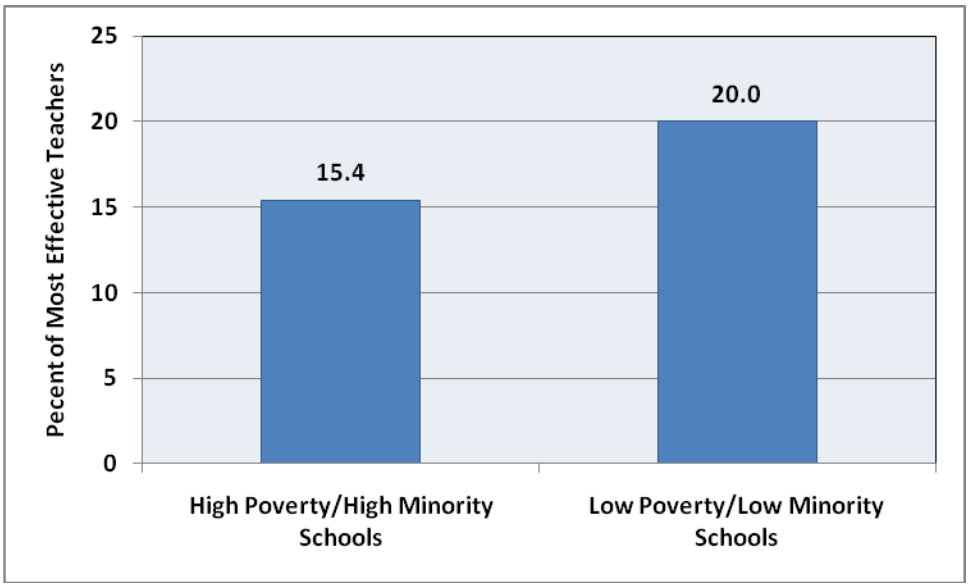
Distribution of the Most Effective Teachers

In high poverty/high minority schools, teachers who fall into the "most effective" category make up 15.4 percent of the teaching staff. Meanwhile, in low poverty/low minority schools, these teachers comprise 20.0 percent of the teaching staff (**Figure 1A**).

Figure 1A: Distribution of the Most Effective Teachers



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Distribution of the Least Effective Teachers

In high poverty/high minority schools, teachers who fall into the "least effective" category make up 19.6 percent of the teaching staff. In low poverty/low minority schools, these teachers comprise 13.2 percent of the teaching staff (**Figure 2A**).

Figure 2A: Distribution of the Least Effective Teachers

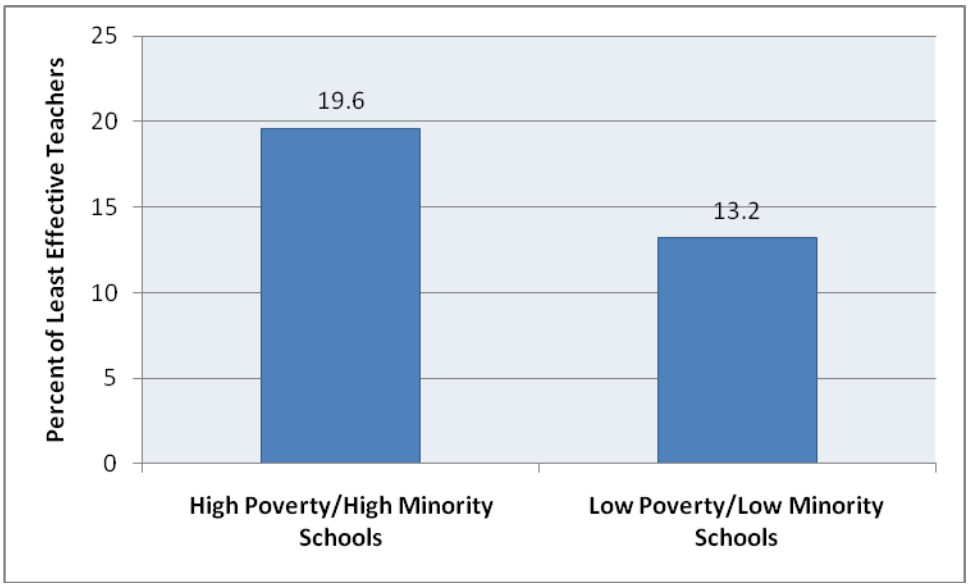

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Figure 3A compares the percentage of most effective teachers by experience level in high poverty/high minority schools to the percentage of most effective teachers by experience level in low poverty/low minority schools.

Among teachers with 5 years of experience or less:

- Low poverty/low minority schools have a slightly larger percentage (1.3%) of most effective teachers with 0-2 years of experience than high poverty/high minority schools.
- High poverty/high minority schools have a larger percentage (4.2%) of most effective teachers with 3-5 years of experience than low poverty/low minority schools.
- For both types of schools, teachers with 3-5 years of experience are more likely to fall into the most effective category than teachers with up to 2 years of experience.

Among teachers with 6 or more years of experience:

- High poverty/high minority schools have a significantly smaller percentage of most effective teachers than low poverty/low minority schools. And the gap widens over time because:
- In low poverty/low minority schools, as teachers gain experience, they are more likely to fall into the most effective category.

In high poverty/high minority schools, however, teacher effectiveness declines among teacher with between 5 and 10 years of experience and increases more slowly thereafter than in low poverty/low minority schools.

Figure 3A: Distribution of the Most Effective Teachers by Experience

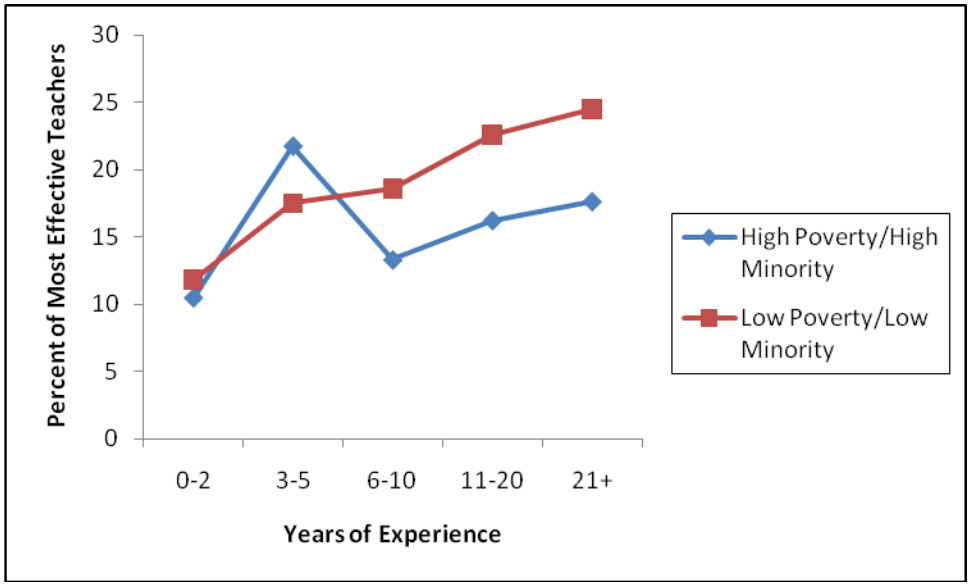

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Figure 4A compares the percentage of least effective teachers by experience level in high poverty/high minority schools to the percentage of least effective teachers by experience level in low poverty/low minority schools.

It shows that among teachers with 0-2 years of experience as well as among teachers with over 5 years of experience:

- High poverty/high minority schools have a larger percentage of least effective teachers than low poverty/low minority schools.

Among teachers with 3-5 years of experience:

- Low poverty/low minority schools have a slightly larger percentage (0.3%) of least effective teachers than high poverty/high minority schools.

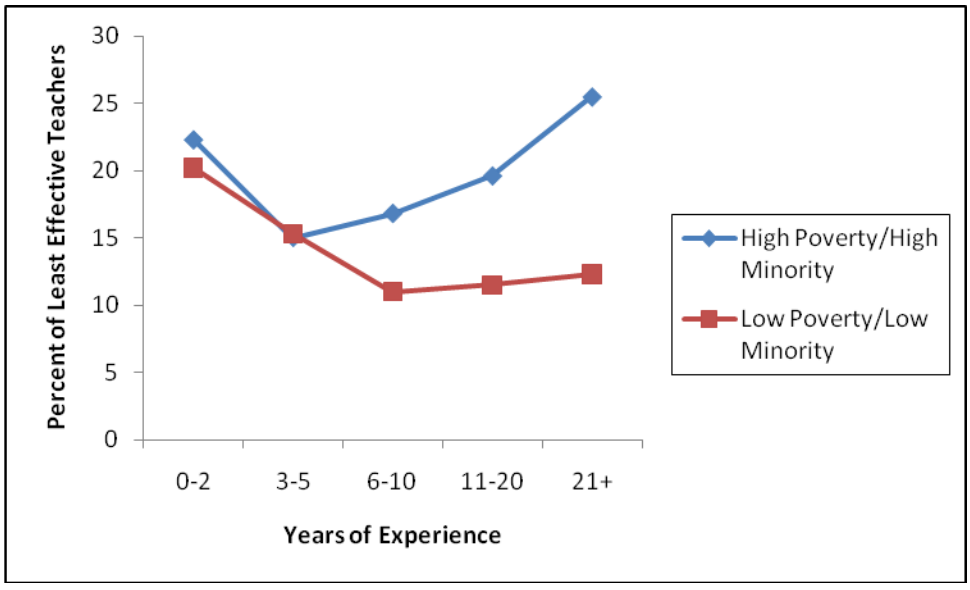
Among teachers with up to 5 years of experience:

- In both types of schools, teachers with 3-5 years of experience are much less likely to fall into the least effective category than teachers with up to 2 years of experience.

Among teachers with 6 or more years of experience:

- In high poverty/high minority schools, teachers are more likely to fall into the least effective category as they gain more experience. In low poverty/low minority schools, the percentage of teachers in the least effective category increases slightly. However, paralleling the trend discussed above for most effective teachers, the gap between teachers in high poverty/high minority schools and teachers in low poverty/low minority schools who fall into the least effective category widens as the teachers gain more experience.

Figure 4A: Distribution of the Least Effective Teachers by Experience



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